Care of the Burn Patient

Presented by
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Introduction

- A burn is an injury caused by extremes of temperature, electric current, chemicals, or radiation.
- In this session we will learn how to determine percentage and severity of burns, proper treatment, and delivery to the appropriate medical facility.

Functions of the skin

- Protects the body
- Nerves in the skin report to the brain on the environment and many sensations
- Regulates temperature
- Any break in the skin allows bacteria to enter and raises the possibility of infection, fluid loss, and loss of temperature control

Types of Burns

- Focus on the treatment of life-threatening injuries even though burn may consume attention
- Three types of Burns
  - Superficial (1st degree)
  - Partial thickness (2nd degree)
  - Full thickness (3rd degree)
Superficial -- 1st Degree

Superficial (1st degree) – involves only the upper layers of the epidermis and dermis. It is an irritation of the living cells in this region and results in some pain, minor edema, and erythema.

Partial Thickness Burn-2ND Degree

- Epidermis and Dermis
- No other underlying tissue
- Intense pain
- Skin may appear white or red, moist or mottled
- Blisters usually
Partial Thickness Burn-2nd degree

Full Thickness-3RD Degree

- Through all dermal layers
- SQ tissue, muscle, bone, and/or organs involved.
- Nerves have been burnt away.
  - Thus no pain
  - However, there may be extreme pain where full thickness and partial thickness interface.

Classification of Burns

- **Thermal Burns** – caused by exposure to excessive heat.
- **Electrical Burns** – caused by direct contact with electricity.
- **Radiation Burns** – caused by exposure to ionizing radiation
- **Chemical Burns** – caused by contact with chemicals.
Thermal burns

- Caused by exposure to heat and/or flame
- Time and intensity of exposure affects amount of tissue damaged

Electrical Burns

- Energy follows path of least resistance
- Usually two wounds-entry and exit
- Significant damage between the two wounds
- Smaller area of contact results in greater damage
- Myoglobin and hemoglobin released
Radiation Burns

• Radioactive water
• Solid material
• X-rays
• Rx - Remove source & treat burn

Chemical Burns

• Prevalent in Pacific Northwest due to:
  • Agriculture
  • Manufacturing
  • Illicit drug factories
• Determine time and chemical strength
• Alkaline compounds may cause more damage than acids

Chemical Burn Injury

Rule of Nines

• System used to estimate the percentage of body surface involved in a burn injury
• To estimate the severity of the burn
• To “paint” a picture in the mind of the M.D.
Minor Burns

- <15% of BSA
- No complications or involvement of hands, face, feet, or perineum.
- No evidence of inhalation burns, associated injury, or severe preexisting medical problem.

Moderate Burns

- 15-25% of BSA
- No complications or involvement of the face, hands, feet or perineum.
- No evidence of inhalation burns, associated injury, or severe preexisting medical problem.

Major Burns

- 25% or greater of BSA burns
- A functionally significant involvement of hands, face, feet, or perineum.

*Washington State’s Trauma Triage Guidelines- Combination of burns >= 20% or involving face or airway

Rapid transport to highest level trauma center within 30 minutes by ground/air
**Initial Patient Assessment**

- Rule out possible c-spine involvement.
- Determine level of consciousness.
- ABC’s

**Airway Assessment**

- **Airway** – look for signs of inhalation injury.
  - Soot around mouth and nose. Black mucus from mouth. Visible burns around nose and mouth.

**Suspect Inhalation injury**

- History of closed-space exposure for longer than 10 minutes
- Soot in sputum
- HbCO levels above 15%
- Bronchospasm-???
- Odynophagia-???
- Central facial burns
- Soot on face or neck
- Singed nasal hairs
- Altered level of consciousness
**Toxic Chemicals**

<table>
<thead>
<tr>
<th>Burning Source</th>
<th>Toxic Substance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organic materials</td>
<td>Carbon monoxide</td>
</tr>
<tr>
<td>Polyurethane</td>
<td>Hydrogen cyanide, ammonia, halogen acids</td>
</tr>
<tr>
<td>Rubber</td>
<td>Sulfur dioxide</td>
</tr>
<tr>
<td>Upholstery</td>
<td>Hydrogen chloride</td>
</tr>
<tr>
<td>Wool, silk</td>
<td>Hydrogen cyanide, hydrogen sulfide</td>
</tr>
<tr>
<td>Polyvinyl chloride</td>
<td>Phosgene</td>
</tr>
</tbody>
</table>

**Breathing Assessment**

- **Breathing** – Make sure patient is breathing adequately and give supplemental oxygen via nonrebreather mask.
- Auscultate lung sounds
- Listen for Stridor/whistling?

**Circulation Assessment**

- Blood vessels dilate- ↓BP
- Blood vessels leak- ↓BP
- Systematic changes with 2° & 3° burns > 20 - 25%, in healthy adult
- Check pulses below injury site-electrical
- IV fluids (if able)

**Burn Treatment**

- Remove sources of heat
- Remove any clothing that may be burned, covered with chemicals or are constricting
- Decon as needed- 20-30 minutes H20
- Watch the airway- high flow O2
  - intubate early, if inhalation injury suspected
**Burn Treatment**

- Monitor
- Consider medication for pain control (if able)
- Keep the patient warm, wrap in clean sheet and blanket
- Elevate burned extremities above level of heart- electrical

**Burn Treatment**

- Treat any other injuries.
- Transport to appropriate facility while monitoring vital signs and airway.
- Estimate the burn size based on the rule of nines or based on patient palm size
  - Patient’s palm should be close to 1% TBSA

**Modified Parkland Burn Formula**

- Formula to calculate the volume of fluid necessary for fluid replacement
- **Adult** \( 3\text{ml} \times \left(\% \text{ of BSA} \ 2^{nd} \ or \ 3^{rd} \ burns\right) \times \text{kg} = \text{fluid replacement for first 8 hours after insult.}**
Name that Burn

• Cause?
• Depth?
• Treatment?
• Percent total body surface area?
Name that Burn

• Cause?
• Depth?
• Treatment?
• Percent total body surface area?

Question 1

• Which of the following is not a classification of a burn injury?
  a. Superficial
  b. Deep fascia
  c. Partial thickness
  d. Full thickness

Question 2

• Which of the following signs or symptoms may indicate that a patient has an inhalation injury:
  a. Stridor/wheezing
  b. Singed nasal hairs
  c. Inspiratory wheezing
  d. All of the above
Question 3
The cause of death from electricity can be attributed to all the following, except.
a. The electrical effect on the heart.
b. Scar tissue formation.
c. Massive muscle destruction from the current passing through the body.
d. Thermal burns from contact with the electrical source.

Question 4
All of the following should be considered in the treatment of a major burn patient, except.
a. Cool the patient with cold water
b. High flow O2
c. Replace fluids with IV's
d. Transport to appropriate facility

Question 5
The “rule of nines” is a method of determining
a. Percent of body surface burned
b. Severity of the burn
c. Classification of the burn
d. Type and depth of the burn

Super Secret Question
What is the medical term for painful swallowing?
Answer: Odynophagia
Questions??

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